

Technical Information

Radio

FM-LW-MW-SW 6-Band
Portable Radio

RF-2800LBS RF-2900LBS

Subject: Frequency Counter Circuit

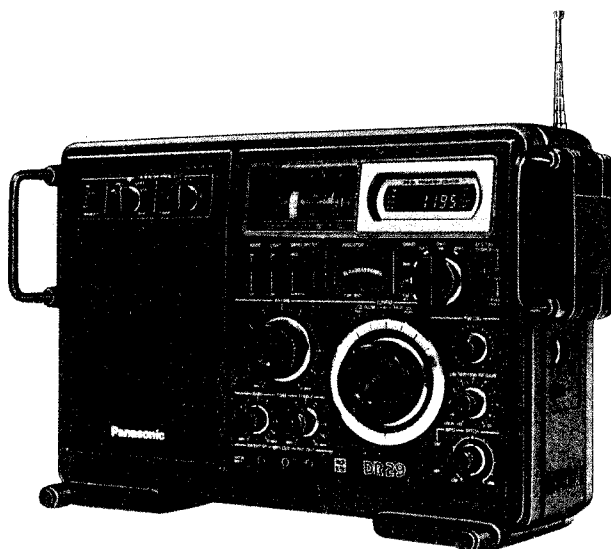


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RF-2800/RF-2900 Frequency Counter Circuit

I. Outline:

The RF-2800/RF-2900 displays the frequency of the received broadcast by counting the frequency of the local oscillator and scaling accordingly. Figure 1 is a block diagram for the receiver. The following relationships exist between the reception frequency (f_s), the local oscillator frequency (f_o), the intermediate frequency (f_i) and the display frequency (f_d).

(A) $f_s \pm f_i = f_o \dots (1)$

(B) $f_d = f_s = f_o \pm f_i \dots (2)$

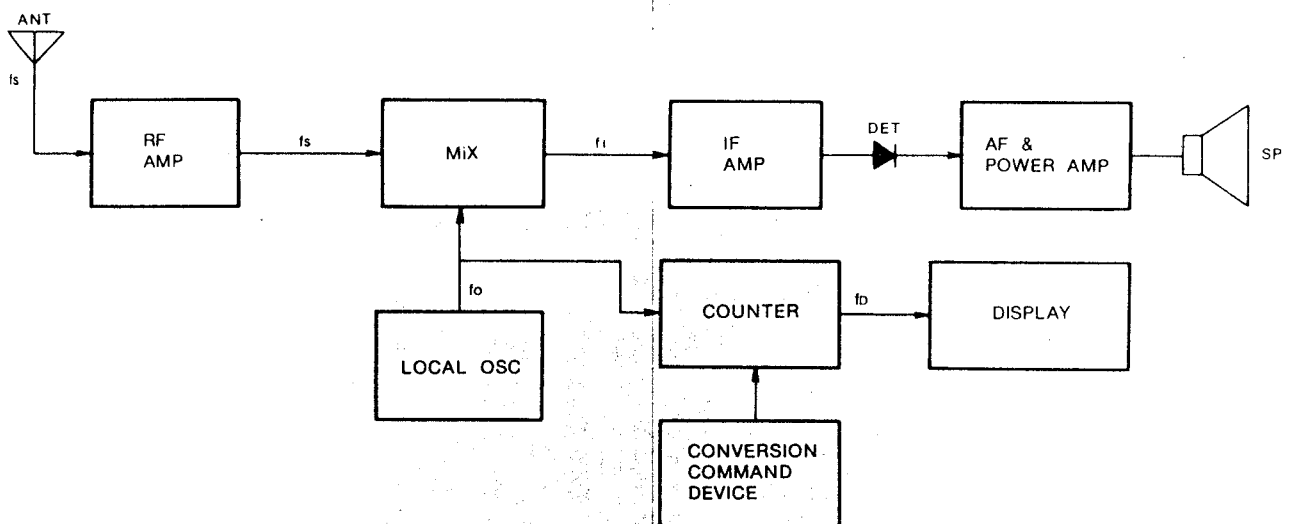


Fig. 1

With reference to figure 1, for example

Reception frequency (f_s) = 10 MHz

Intermediate frequency (f_i) = 455 kHz

Under these conditions, the local oscillator frequency (f_o) must be, according to formula (1), 10.455 MHz (called "upper local oscillation") or 9.545 MHz (called "lower local oscillation"). Thus, if 10.455 MHz is used as the local oscillator signal:

Display frequency (f_d) = 10.455 (f_o) - 0.455 (f_i) = 10 MHz (f_s) (3)

Therefore, the display frequency is equivalent to the reception frequency.

The subtraction of the 0.455 MHz (f_i) is accomplished by the conversion command device to the counter.

If the unit were designed to use the lower local oscillator frequency, a signal (preset frequency = +0.455 MHz) would be applied to the counter in order to add 0.455 MHz.

At the same time, in models which use different frequency, such as 2 MHz, for the intermediate frequency (f_i), a conversion signal is applied to the counter in order to add (or subtract) 2 MHz, so that the reception frequency will be correctly displayed.

In short, the conversion signal must be equal to $\pm f_i$.

II. Block Diagram

Figure 2 is a chart of the reception frequency, local oscillator frequency and intermediate frequency for each band.

Band	Signal Frequency (MHz)	Intermediate Frequency (MHz)	Local Osc. Frequency (MHz)
FM	87.5 ~ 108	10.7	98.2 ~ 118.7
LW	0.150 ~ 0.410	0.455	0.605 ~ 0.865
MW	0.525 ~ 1.610	0.455	0.980 ~ 2.065
SW1	3.2 ~ 8.0	2	5.2 ~ 10.0
SW2	8.0 ~ 16.0	2	10.0 ~ 18.0
SW3	16.0 ~ 30.0	2	18.0 ~ 32.0

Fig. 2

Because, the upper local oscillator frequency is used the conversion signal is subtracted from the counter circuit for each band.

As can be understood from the table in figure 2, an intermediate frequency of 10.7 MHz is used for the FM band. Because the upper local oscillator frequency is used, the reception frequency is displayed after 10.7 MHz has been subtracted from the local oscillator frequency.

For the LW, MW bands, 455 kHz is subtracted from the local oscillator frequency.

For the SW bands, 2 MHz is subtracted from the local oscillator frequency.

Figures 3 and 4 are block diagrams which include the RF, Local Oscillator, IF and Counter circuits. The subtraction is accomplished through logic signals applied to pins 3, 4, 5 and 6 of IC902.

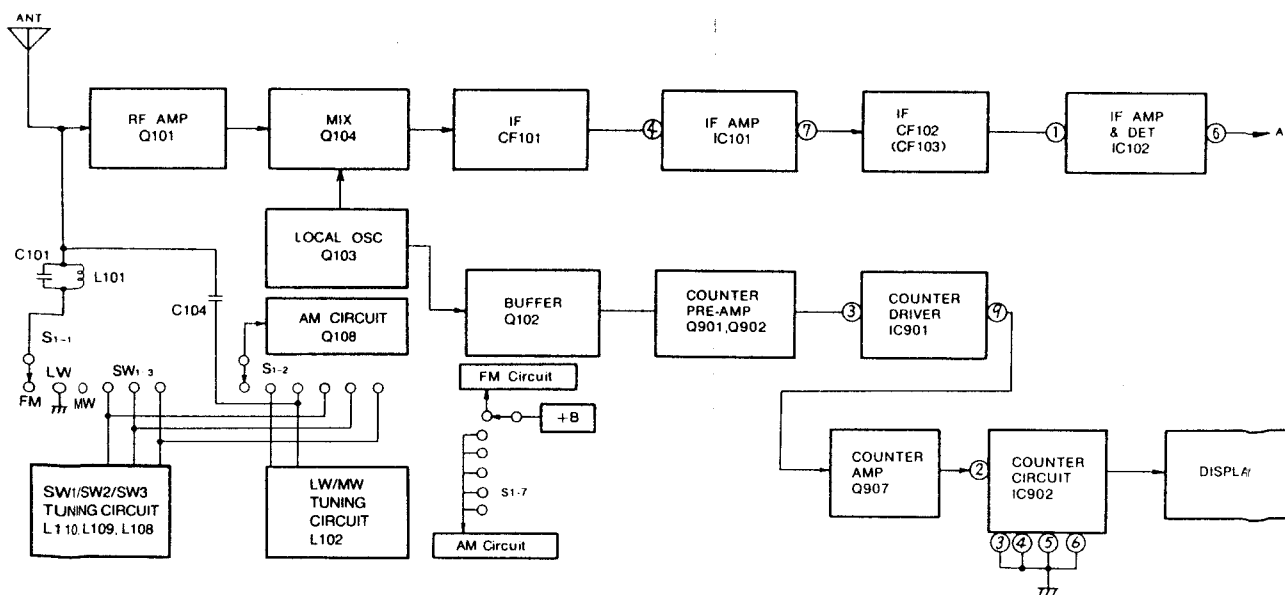


Fig. 3 FM Section Block Diagram

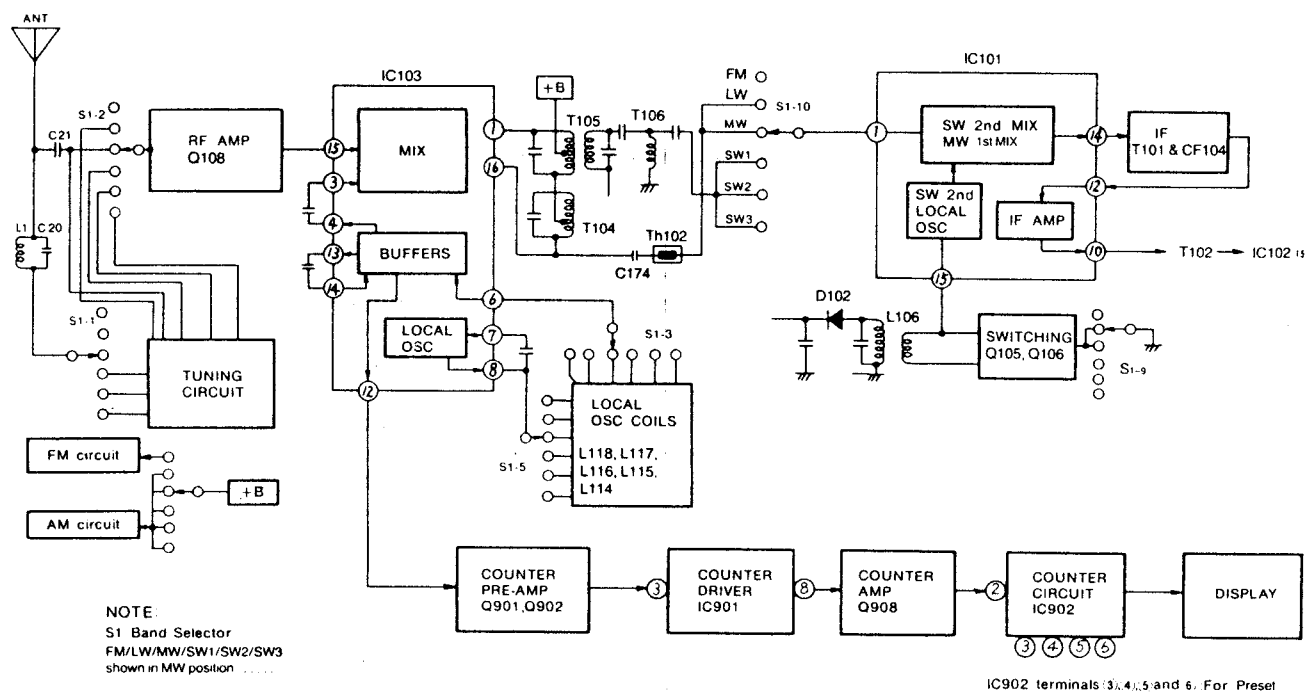


Fig. 4 LW/MW/SW Section Block Diagram

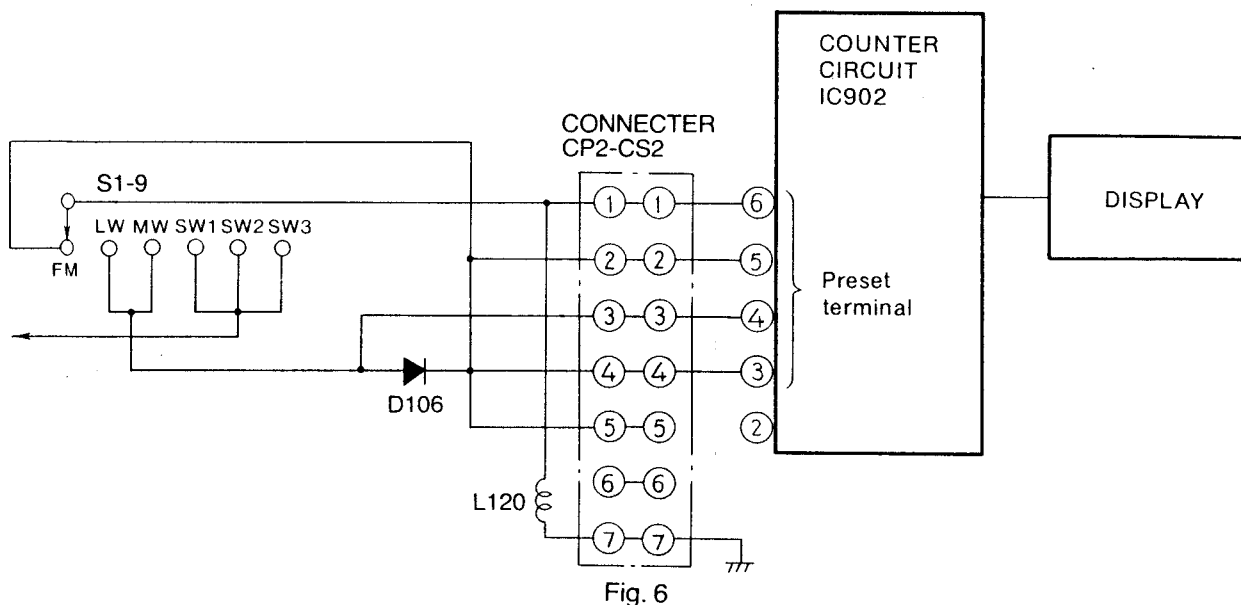
III. Preset Selector Circuit

Figure 5 shows the relationship between the preset terminals (3, 4, 5 and 6) of IC902 and the preset frequency.

Band	Preset terminal				Preset Frequency (MHz)
	3	4	5	6	
FM	L	L	L	L	-10.7
LW/MW	L	H	L	L	-0.455
SW1	H	H	H	L	-2.0
SW2	H	H	H	L	-2.0
SW3	H	H	H	L	-2.0

Fig. 5

Figure 6 shows the preset selector circuitry.



A. For FM:

- (a) Terminal 6 of IC902 becomes an "L" level. (through connectors Pin 1→L120→Pin 7→GRND)
- (b) Terminal 5 of IC902 becomes an "L" level. (through S1-9→Connector Pin 2.)
- (c) Terminal 4 of IC902 becomes an "L" level. (through S1-9→D106→Connector Pin 3)
- (d) Terminal 3 of IC902 is set at an "L" level. (through S1-9→Connector Pin 4)

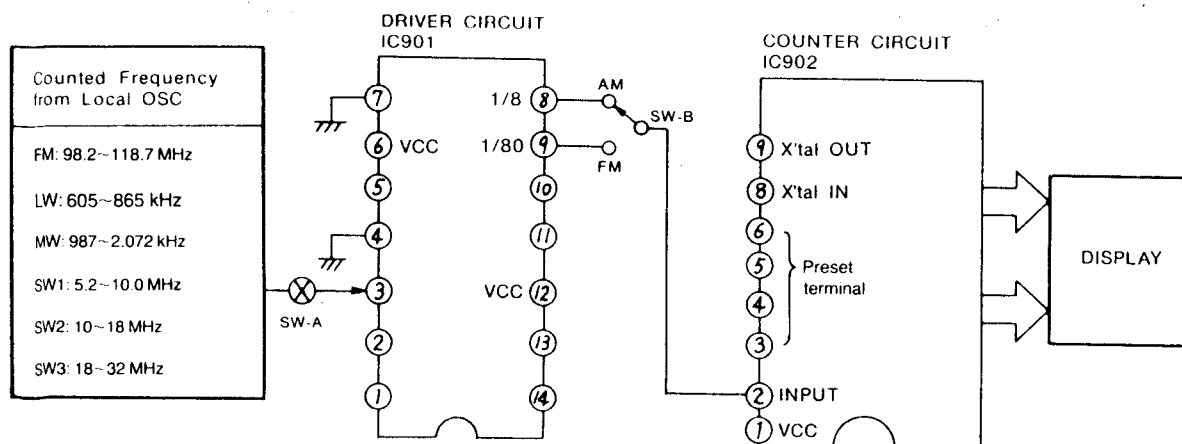
As a result, (refer to the table in figure 5) the counter circuit subtracts 10.7 MHz from the local oscillator frequency (the input signal), and the result is displayed as the reception frequency.

- B.** In the same way, for the LW, MW and SW bands the condition of each preset terminal is changed by the band selector (S1-9) consequently, the preset frequency shown in the table in figure 5 is obtained, and the correct reception frequency is displayed.

IV. Counter Signal Circuitry

Figure 7 shows the counter signal circuitry.

- A.** For each band, the local oscillator signal from the local oscillator circuitry is selected (FM, LW, MW or SW) by SW-A, and is supplied to terminal 3 of the driver circuit (IC901).
- B.** This signal is frequency divided (1/8) by IC901, and is output from terminal 8. At the same time, a signal (frequency divided by 1/80) is output from terminal 9.



- C. These two output signals are selected (by SW-B): the 1/8 frequency divided output (from terminal 8) for the LW, MW band and SW₁~SW₃ bands, and the 1/80 frequency divided output (from terminal 9) for the FM band are applied to the input terminal (terminal 2) of the counter circuit (IC902).
- D. These frequencies are converted, by IC902, into the original local oscillator frequencies. Moreover, depending upon the signal applied to the preset terminals, the necessary frequency for each band is subtracted from the derived local oscillator frequencies and the resulting frequency is supplied to the display.

V. Signal Selector Circuitry

Figure 8 shows the signal selector circuitry for the counter.

- A. For the FM band, since the band selector (S₁₋₉) is in the "FM" position, the base of each transistor (Q904, Q905 and Q906) becomes an "L" level, consequently, Q904 and Q905 turn on, and Q906 turns off. As a result, the signal from the FM band local oscillator flows as shown below, and is counted at the counter circuitry.

FM Local osc → C902 → Q901 → Q902 → C908 → IC901(3) → IC901(9) → C914 → Q907 → IC902(2)

In this case instance, the local oscillator circuitry for the LW, MW and SW bands does not function (refer to figures 3, 4 and the +B selector).

The signal (AM) from the 1/8 frequency divider is output from terminal 8 of IC901.

However, because Q905 is turned on thus shorting its collector to emitter junction, the base to emitter junction of Q908 is also shorted, therefore, the signal current can not flow to the counter circuit.

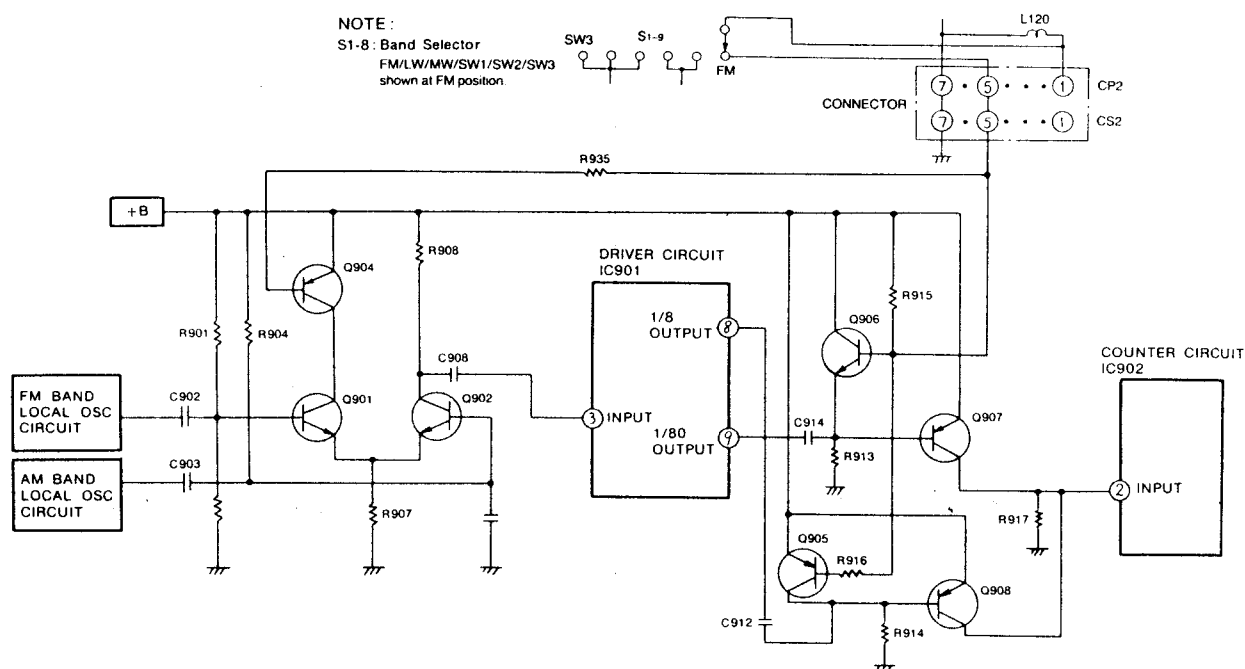


Fig. 8

- B. For the LW, MW and SW₁~SW₃ bands, S₁₋₉ is open, the base (Q904, Q905 and Q906) become an "H" level, consequently Q904 and Q905 turn off, and Q906 turns on. As a result, transistor Q907 turns off (base to emitter junction shorted by Q906) which results in Q901 turning off. Therefore, the signal from the AM local oscillator circuit flows as shown below, and is supplied to the counter circuitry (IC902).

AM local osc → C903 → Q902 → C908 → IC901(3) → IC901(8) → C912 → Q908 → IC902(2)

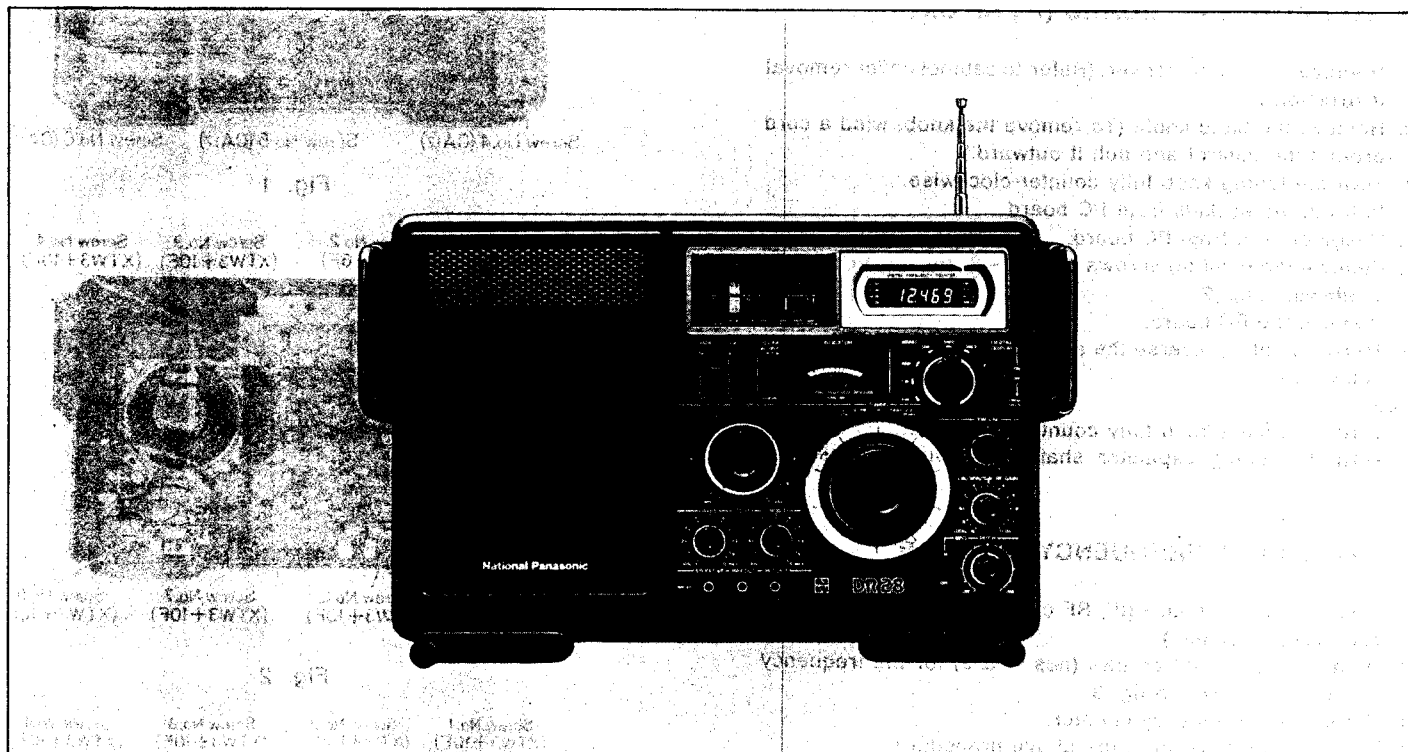
In this case, the local oscillator circuitry for the FM band does not function.

The above is a description of the operation of the frequency counter circuitry for models RF-2800/RF-2900. The frequency counter circuitry for other models is similar. Refer to RF-4900 Technical Information (Order No. RD8002-T1028), because the counter circuitry for models RF-2800/RF-2900 uses the same LSI as model RF-4900.

Service Manual

FM/LW/MW/SW
6-BAND PORTABLE RADIO

Radio
RF-2800LBS



■ SPECIFICATIONS

Frequency Range:	FM	87.5~108 MHz	Power Source:	AC 110~125V/220~240V 50~60 Hz or 9V (Six "D" Size Flashlight Batteries) (National UM-1 or equivalent)
	LW	150~410 kHz (2000~731m)		
	MW	525~1610 kHz (571~186m)		
	SW ₁	3.2~8 MHz (93.8~37.5m)		
	SW ₂	8~16 MHz (37.5~18.7m)		
	SW ₃	16~30 MHz (18.7~10m)		
	Intermediate Frequency:	FM 10.7 MHz		
	AM (LW, MW & SW)	455 kHz		
	Sensitivity:	FM 2.5 μ V (S/N 26 dB), 2 μ V (3 dB down limiter sens.)		
		LW 70 μ V/m (S/N 6 dB), 600 μ V/m (S/N 26 dB)		
Power Output:	MW	30 μ V/m (S/N 6 dB), 400 μ V/m (S/N 26 dB)	Power Consumption:	11W (AC Only)
	SW ₁	1.8 μ V (S/N 6 dB), 19 μ V (S/N 26 dB)		
	SW ₂	0.8 μ V (S/N 6 dB), 9 μ V (S/N 26 dB)		
	SW ₃	1.2 μ V (S/N 6 dB), 13 μ V (S/N 26 dB)		
Power Output:			Speaker:	10 cm (4") PM Dynamic Speaker
Power Output:			Dimensions:	381(Wide) x 246(High) x 120(Deep)mm (15" x 9 7/8" x 4 3/4")
Power Output:			Weight:	2.3 kg. (8 lb. 10 oz.) without batteries
Power Output:			Impedance:	Speaker8 Ω
				Earphone Jack8 Ω
				Multiplex Out Jack10k Ω (40mV)
				FM Antenna Terminal75 Ω
				Phono Jack..... 500k Ω (50mV)
				Recording Out Jack80k Ω (100mV)

Specifications are subject to change without notice for further improvement.

■ TO REMOVE CABINET COVER

1. Remove the battery cover.
2. Remove the six (6) screws (nos. 1~6) for the cabinet cover, as shown in fig. 1.
3. Remove the cabinet cover.
4. Pull out sockets from PC board.
5. To reassemble, reverse the above procedure.

■ TO REMOVE PC BOARD (IF, RF Circuit)

1. Remove the cabinet cover. (Refer to cabinet cover removal instruction.)
2. Remove the band knob. (To remove the knob, wind a cord around the control and pull it outward.)
3. Turn the tuning knob fully counter-clockwise.
4. Pull out the sockets from PC board.
5. Unsolder lead from PC board.
6. Remove the eight (8) screws (nos. 1~8) for the PC board, as shown in fig. 2.
7. Remove the PC board.
8. To reassemble, reverse the above procedure and note the followings.

Notes

1. Turn the tuning knob fully counter-clockwise.
2. Turn the tuning capacitor shaft fully counter-clockwise.

■ TO REMOVE FREQUENCY COUNTER

1. Remove the PC board (IF, RF circuit). (Refer to PC board removal instruction.)
2. Remove the two (2) screws (nos. 1 & 2) for the frequency counter, as shown in fig. 3.
3. Remove the frequency counter.
4. To reassemble, reverse the above procedure.

■ TO REMOVE PC BOARD (Frequency Counter)

1. Remove the frequency counter. (Refer to frequency counter removal instruction.)
2. Remove the four (4) screws (nos. 1~4) for the frequency counter cover, as shown in fig. 4.
3. Remove the two (2) screws (nos. 1 & 2) for the PC board, as shown in fig. 5.
4. Remove the PC board.
5. To reassemble, reverse the above procedure.

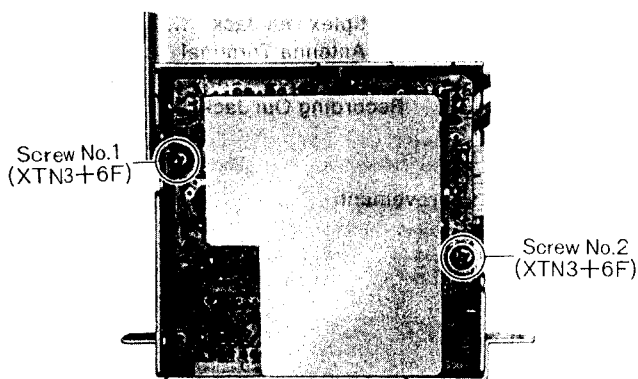


Fig. 5

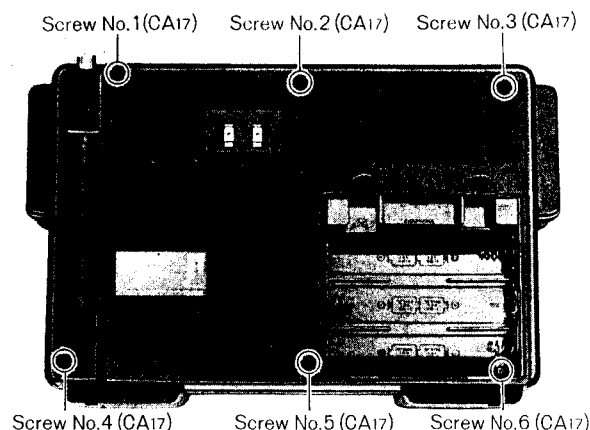


Fig. 1

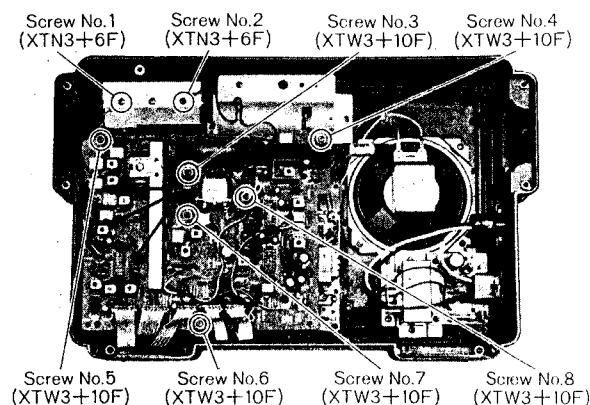


Fig. 2

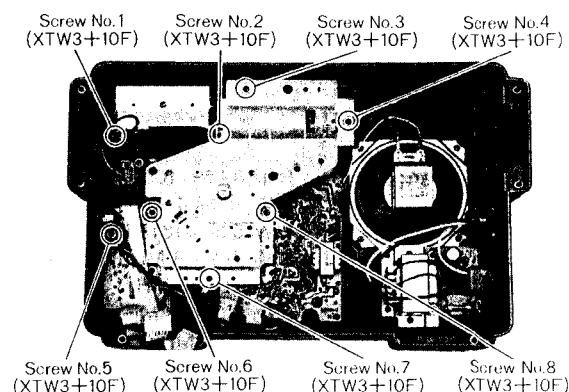


Fig. 3

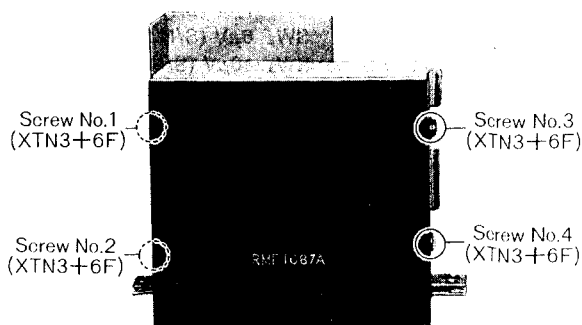


Fig. 4

■ TO REMOVE DIAL SCALE CHASSIS

1. Remove the PC board (IF, RF circuit). (Refer to PC board removal instruction.)
2. Remove the tuning knob.
3. Remove the six (6) screws (nos. 3~8) for the dial scale chassis, as shown in fig. 3.
4. Remove the dial scale chassis.

■ TO REMOVE DIAL MECHANISM

1. Remove the dial scale chassis. (Refer to dial scale removal instruction.)
2. Remove the dial belt, as shown in fig. 7.
3. Remove the two (2) screws (nos. 1 & 2) for the dial mechanism, as shown in fig. 6.
4. To reassemble, reverse the above procedure and note the followings.

Notes

1. Turn the tuning shaft fully counter-clockwise.
2. Set the dial scale at the position, as shown in fig. 7.
3. Attach the dial belt.
4. Refer to dial scale removal instruction.

■ TO REMOVE DIAL SCALE

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the one (1) screw for the dial scale spring, as shown in fig. 7.
3. Remove the dial scale.
4. To reassemble, reverse the above procedure and note the followings.

Notes:

1. Loosen the two (2) screws (nos. 1 & 2) for the dial scale gear, as shown in fig. 8.
2. Set the catch of dial scale gear to the start point of dial scale, as shown in fig. 9.
3. Turn the tuning shaft fully counter-clockwise.
4. After mounting the PC board (IF, RF circuit), turn the dial scale by pushing the catch of dial scale and set the start point of dial scale to the catch of cabinet, as shown in fig. 10.
5. Tighten the two (2) screws (nos. 1 & 2) for the dial scale gear, as shown in fig. 10.

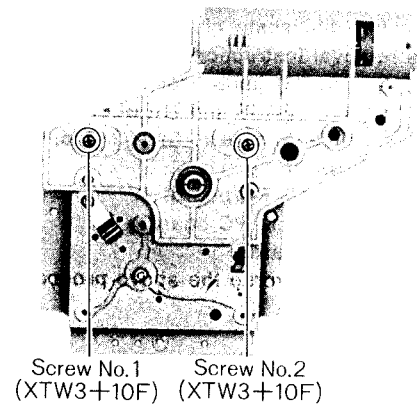


Fig. 6

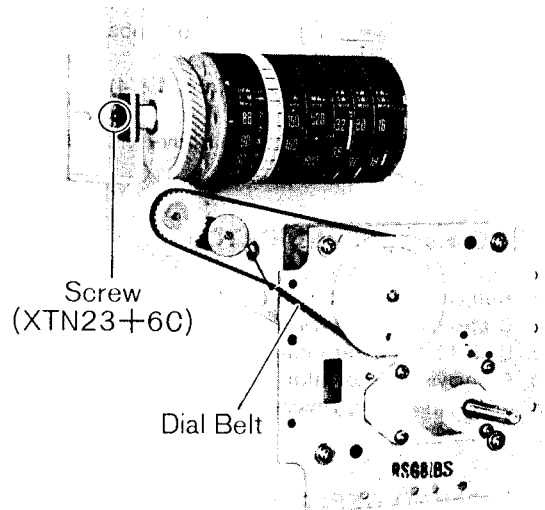


Fig. 7

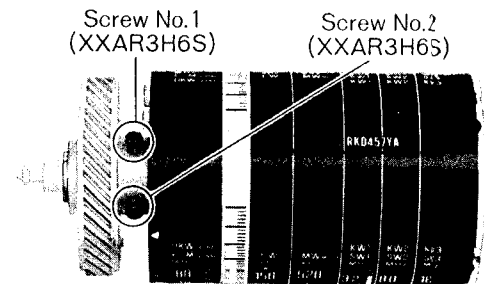


Fig. 8

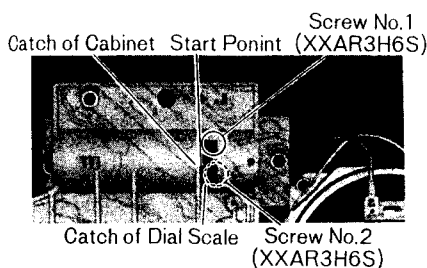


Fig. 10

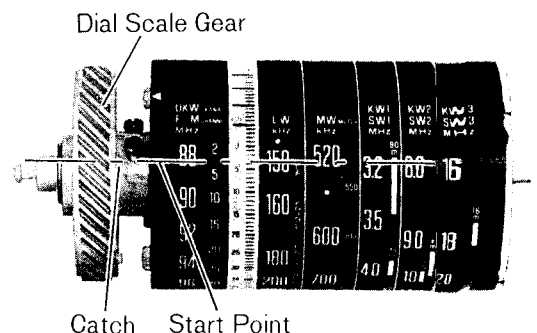


Fig. 9

■ TO REMOVE PC BOARD (AF Circuit)

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the six (6) knobs for the RADIO, LIGHT, BAND WIDTH, VOLUME, BASS and TREBLE.
3. Remove the five (5) screws (nos. 2, 3, 5, 6 & 7) for the PC board, as shown in fig. 11.
4. Unsolder lead from PC board.
5. Pull out sockets from PC board.
6. Remove the PC board.
7. To reassemble, reverse the above procedure.

■ TO REMOVE PC BOARD (Control Circuit)

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the three (3) knobs for the SW CAL, RF GAIN and PITCH. (To remove those control knobs wind a cord around the control and pull it outward.)
3. Remove the two (2) screws (nos. 1 & 4) for the PC board.
4. Remove the PC board.
5. To reassemble, reverse the above procedure.

■ TO REMOVE INDICATOR

1. Remove the PC board (AF circuit).
(Refer to PC board removal instruction.)
2. Unsolder the terminal of indicator, as shown in fig. 12.
3. Remove the Indicator.
4. To reassemble, reverse the above procedure.

■ HOW TO REPLACE CHIP

1. Remove solder for chip completely.
2. Remove chip by nippers, as shown in fig. 13.
3. Use tube for service parts as shown in fig. 14 and solder service parts according to following table. (please refer to Circuit Board Wiring View for the value of resistor and capacitor).

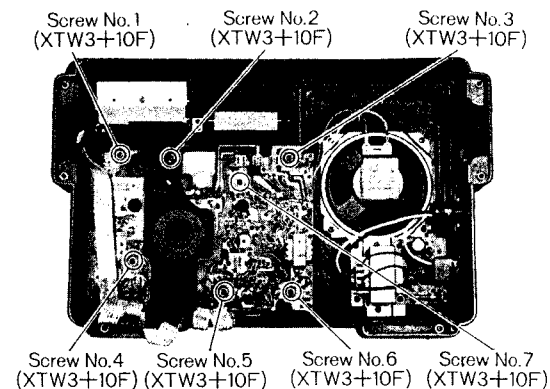


Fig. 11

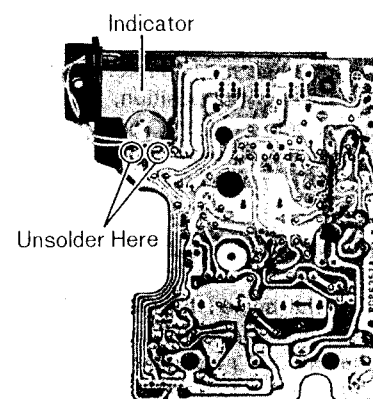


Fig. 12

Color	Original Parts Name	Service Parts Name
Black	Chip Resistor	Carbon Resistor
Brown	Chip Capacitor	Ceramic Capacitor
Blue	Chip Jumper	Lead Wire

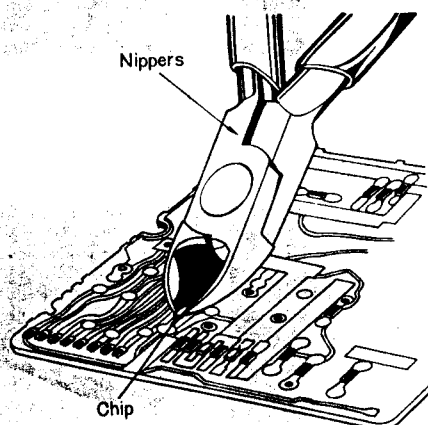


Fig. 13

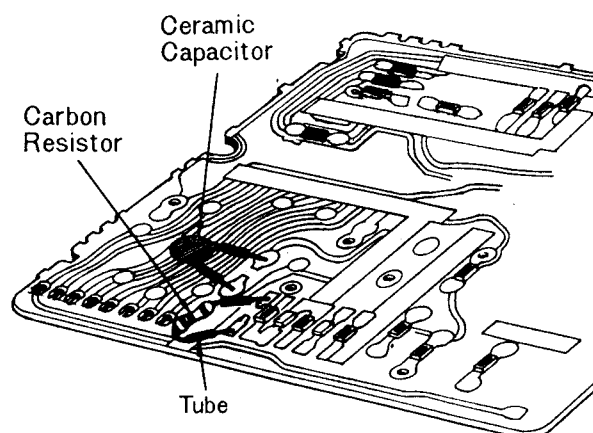


Fig. 14

■ BLOCK DIAGRAM

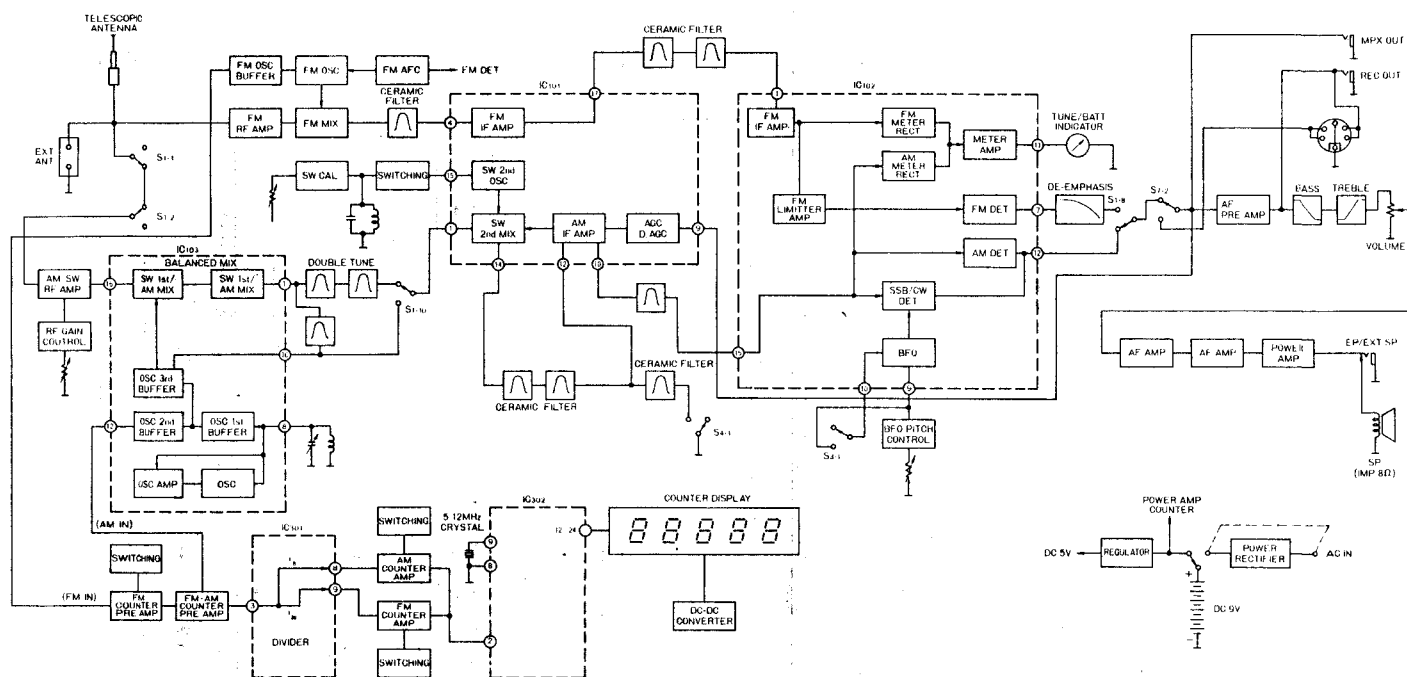


Fig. 15

■ ALIGNMENT POINTS

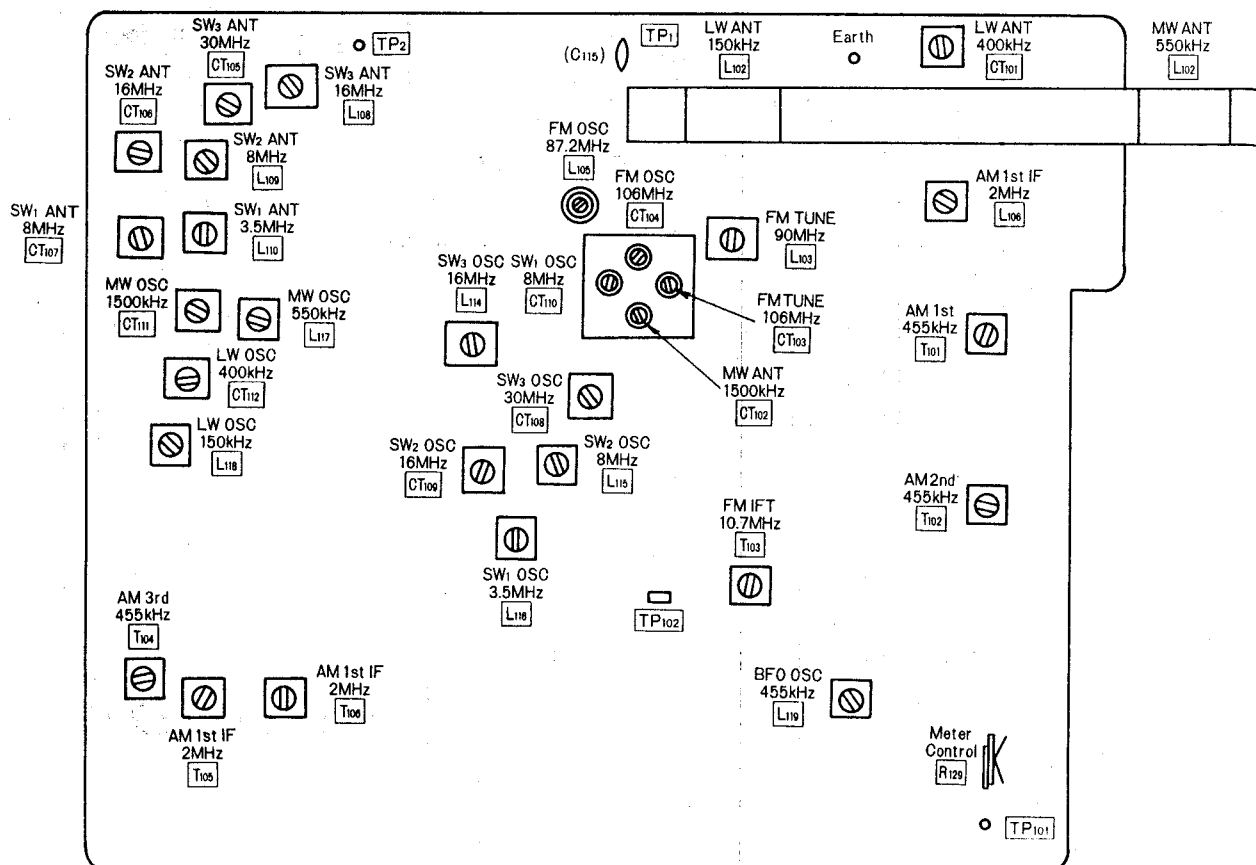


Fig. 16

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set volume control to maximum.
2. Radio ON/OFF switch to ON.
3. Set bass and treble control to maximum.
4. Set band switch to MW, LW, SW or FM.
5. Set digital display switch to OFF position.
6. Set RF gain control to high.
7. Light switch to OFF position.
8. Set FM AFC/Band width switch to narrow, OFF position for the AM-IF, BFO, and FM adjustment, and to wide ON position for other adjustment.
9. Set pitch control to center.
10. Set BFO switch to ON position for BFO adjustment, and to OFF position for other adjustment.
11. Set SW Cal control to center.
12. Set power source voltage to 9V DC.
13. Output of signal generator should be no higher than necessary to obtain an output reading.

■ AM AND SW ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
AM-2nd IF ALIGNMENT						
(1) AM	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. at 400 Hz	Point of non-interference.	Output meter across voice coil.	T ₁₀₁ (AM 1st IFT) T ₁₀₂ (AM 2nd IFT) T ₁₀₄ (AM 3rd IFT)	Adjust for maximum output.
LW-RF ALIGNMENT						
(2) LW	"	150 kHz	150 kHz (Refer to fig. 17)	Output meter across voice coil	L ₁₁₈ (LW OSC Coil) (*) L ₁₀₂ (LW ANT Coil)	Adjust for maximum output. Adjust L ₁₀₂ by moving coil bobbin along ferrite core.
(3) LW	"	400 kHz	400 kHz (Refer to fig. 18)	"	CT ₁₁₂ (LW OSC Trimmer) CT ₁₀₁ (LW ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
MW-RF ALIGNMENT						
(4) MW	"	550 kHz	550 kHz (Refer to fig. 19)	Output meter across voice coil	L ₁₁₇ (MW OSC Coil) (*) L ₁₀₂ (MW ANT Coil)	Adjust for maximum output. Adjust L ₁₀₂ by moving coil bobbin along ferrite core.
(5) MW	"	1500 kHz	1500 kHz (Refer to fig. 20)	"	CT ₁₁₁ (MW OSC Trimmer) CT ₁₀₂ (MW ANT Trimmer)	Adjust for maximum output. Repeat steps (4) and (5).
(*) Cement antenna bobbin with wax after completing alignment.						
AM-1st IF ALIGNMENT						
(6) SW ₁	Connect to EXT ant. terminal through ceramic capacitor (10 PF). Negative side to earth	2 MHz	Point of non-interference.	"	L ₁₀₆ (AM 1st IFT) T ₁₀₅ (AM 1st IFT) T ₁₀₆ (AM 1st IFT)	Adjust for maximum output.
SW ₁ -RF ALIGNMENT						
(7) SW ₁	"	3.5 MHz	3.5 MHz (Refer to fig. 21)	Output meter across voice coil.	L ₁₁₆ (SW ₁ OSC Coil) L ₁₁₀ (SW ₁ ANT Coil)	Adjust for maximum output.
(8)	"	8.0 MHz	8.0 MHz (Refer to fig. 22)	"	CT ₁₁₀ (SW ₁ OSC Trimmer) CT ₁₀₇ (SW ₁ ANT Trimmer)	Adjust for maximum output. Repeat steps (7) and (8).
SW ₂ -RF ALIGNMENT						
(9) SW ₂	"	8.0 MHz	8.0 MHz (Refer to fig. 23)	"	L ₁₁₅ (SW ₂ OSC Coil) L ₁₀₉ (SW ₂ ANT Coil)	Adjust for maximum output.
(10) SW ₂	"	16 MHz	16 MHz (Refer to fig. 22)	"	CT ₁₀₉ (SW ₂ OSC Trimmer) CT ₁₀₆ (SW ₂ ANT Trimmer)	Adjust for maximum output. Repeat steps (9) and (10).
SW ₃ -RF ALIGNMENT						
(11) SW ₃	"	16 MHz	16 MHz (Refer to fig. 23)	"	L ₁₁₄ (SW ₃ OSC Coil) L ₁₀₈ (SW ₃ ANT Coil)	Adjust for maximum output.
(12) SW ₃	"	30 MHz	30 MHz (Refer to fig. 24)	"	CT ₁₀₈ (SW ₃ OSC Trimmer) CT ₁₀₅ (SW ₃ ANT Trimmer)	Adjust for maximum output. Repeat steps (11) and (12).

■ FM ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS	
	CONNECTIONS	FREQUENCY					
FM-IF ALIGNMENT							
(1)	FM	Connect to test point TP₁ through 0.001 μ F. Negative side to earth.	10.7 MHz	Point of non-interference.	Connect vert. amp. of scope to test point TP₁₀₂ . Negative side to earth.	T ₁₀₃ (FM IFT)	Adjust for maximum amplitude. (Refer to fig. 27)
FM-RF ALIGNMENT							
(2)	FM	Connect to test point TP₂ through FM dummy antenna. (Refer to fig. 28).	87.2 MHz	Variable capacitor fully closed.	Output meter across voice coil.	L ₁₀₅ (FM OSC Coil)	(*) Adjust for maximum output.
(3)	FM	“	90 MHz	90 MHz (Refer to fig. 25)	“	L ₁₀₃ (FM TUNE Coil)	(*) Adjust for maximum output.
(4)	FM	“	106 MHz	106 MHz (Refer to fig. 26)	“	CT ₁₀₄ (FM OSC Trimmer) CT ₁₀₃ (FM TUNE Trimmer)	(*) Adjust for maximum output. Repeat steps. (3)~(4)
(*) Three output responses will be present; proper tuning is the center frequency.							

■ BFO ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
BFO ALIGNMENT Note: Set band width switch to "Narrow".						
SW ₁	Fashion loop of several turns of wire and radiate signal into loop of receiver.	3.5 MHz	Tune to signal.	Audio output from speaker.	L ₁₁₉ (BFO OSC Coil)	1. Cut off modulation after tune to signal. 2. Set BFO switch to ON. 3. Adjust for zero beat.

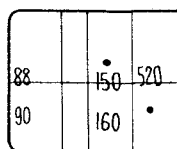
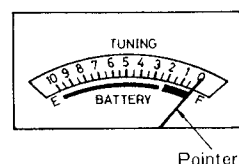
■ TUNE/BATT METER ADJUSTMENT

1. RADIO RECEIVER SETTING

- Set band switch to AM.
- Set volume control MIN.
- Set switch to.
- Set BFO switch to OFF.
- Set power source voltage to 9 volts DC.

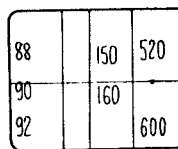
2. REMARKS

- Adjust R₁₂₉ so that the pointer of meter stays as shown in figure right.



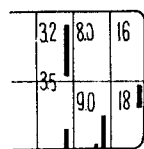
LW (150 kHz)

Fig. 17



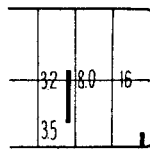
MW (550 kHz)

Fig. 19



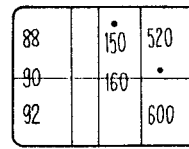
SW₁ (3.5 MHz)

Fig. 21



SW₂ (8 MHz)
SW₃ (16 MHz)

Fig. 23

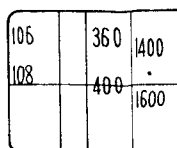


FM (90 MHz)

Fig. 25

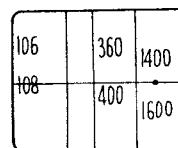


Fig. 27



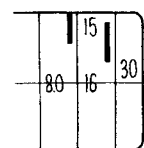
LW (400 kHz)

Fig. 18



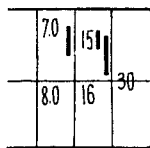
MW (1500 kHz)

Fig. 20



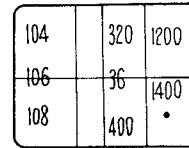
SW₁ (8 MHz)
SW₂ (16 MHz)

Fig. 22



SW₃ (30 MHz)

Fig. 24



FM (106 MHz)

Fig. 26

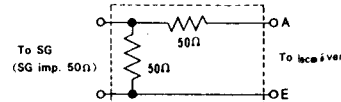
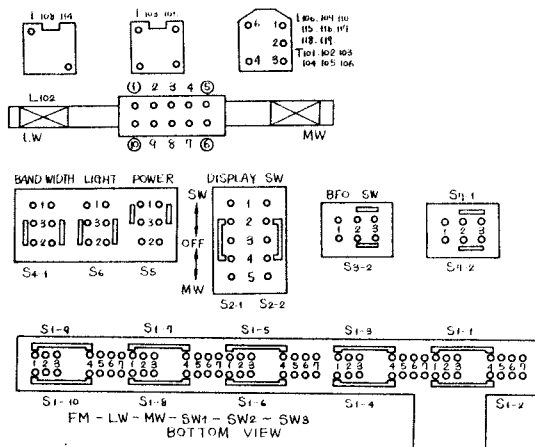
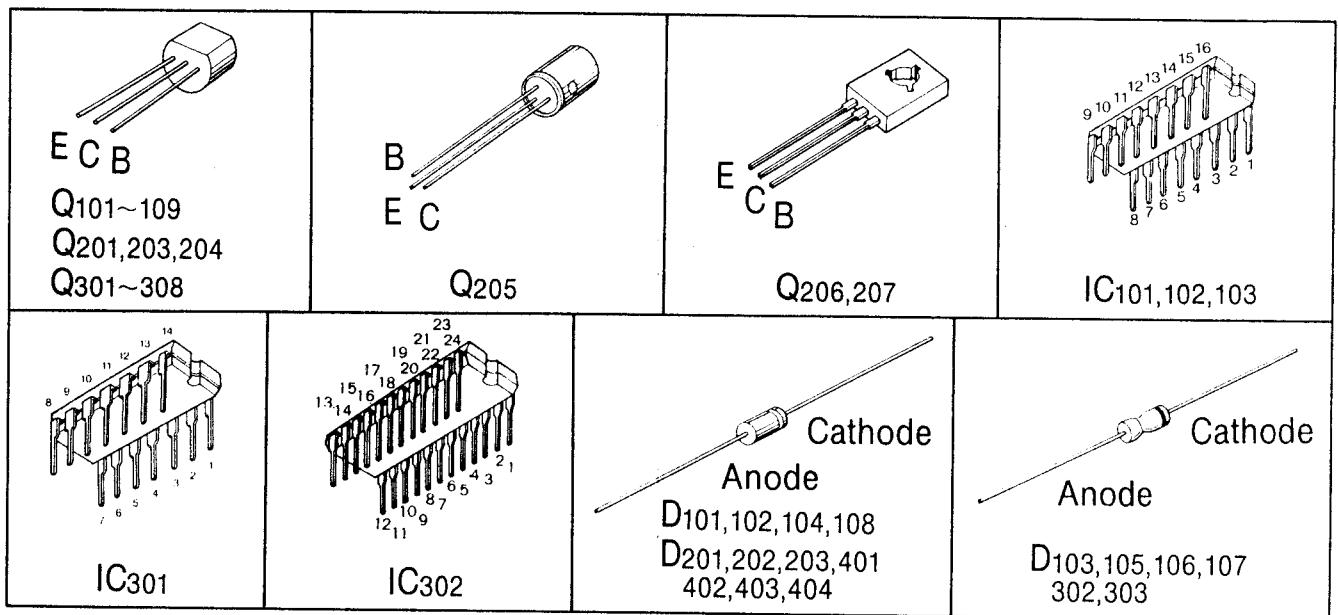


Fig. 28



Notes:

1. S₁₋₁~S₁₋₁₀: Band switch in "FM" position.
2. S₂₋₁, S₂₋₂: Digital display switch in "OFF" position.
3. S₃₋₁, S₃₋₂: BFO switch in "OFF" position.
4. S₄₋₁: Band width switch in "NARROW" position.
5. S₅: Radio ON/OFF switch in "OFF" position.
6. S₆: Light switch in "OFF" position.
7. S₇: Phono/Radio switch in "Radio" position.
8. S₈: Voltage selector switch.
9. DC voltage measurements are taken with 10 k Ω /V voltmeter from negative terminal of battery.
☐.....FM position ().....AM position
☐.....SW position
10. o mark.....chip resistor and capacitor.
11. Battery current. No signal36 mA
 Maximum output600 mA



VOLTAGE

Q 101

FM
D 3.3V
G 0V
S 0V
I _b 3.5mA

Q 102

FM	AM
C 4.8V	0V
B 1.47V	0V
E 0.85V	0V

Q 103

FM
C 0V
B 1.2V
E 2.1V
I _b 0.4mA

Q 104

FM
C 0V
B 3.5V
E 4.4V
I _b 0.8mA

Q 105

FM	AM	SW
C 0.66V	4.45V	4.45V
B 0.18V	3.7V	4.15V
E 0.66V	4.45V	4.45V

Q 106

FM	AM	SW
C 0.2V	0.12V	4.2V
B 0.63V	0.63V	0.1V
E 0V	0V	0V

Q 107

FM	AM
C 1.8V	2.1V
G 0V	0V
S 0V	0V
I _b 2.3mA	2.3mA

Q 108

FM	AM
D 0V	2.1V
G 0V	0V
S 0V	0V
I _b 2.3mA	2.3mA

Q 109

FM	AM
C 0.7V	5.2V
B 0.4V	2.7V
E 0V	2.1V
I _b 2.3mA	2.3mA

Q 201

FM
C 8.3V
B 5.4V
E 5.3V

Q 202

FM
C 5.3V
B 8.3V
E 9V

Q 203

FM
C 2.3V
B 0.3V
E 0.07V

Q 204

FM
C 1.95V
B 0.38V
E 0.43V
I _b 1.2mA

Q 205

FM
C 0.25V
B 3.5V
E 3.75V

Q 206,207

FM
C 9V
B 0.64V
E 0V

Q 901

FM	SW
C 4.8V	0.17V
B 1.25V	0.85V
E 0.56V	0.17V

Q 902

FM	SW
C 3.5V	0.34V
B 0.53V	0.53V
E 0.56V	0.17V

Q 903

FM
C 4V
B 0.06V
E 0V

Q 904

FM	SW
C 4.8V	0.17V
B 4.2V	4.3V
E 4.9V	4.9V

Q 905

FM	SW
C 4.9V	4.9V
B 4.3V	4.3V
E 4.9V	4.9V

Q 906

FM	SW
C 4.9V	4.9V
B 0V	4.2V
E 4.2V	4.3V

Q 907

FM	SW
C 2.5V	3.35V
B 4.2V	4.3V
E 4.9V	4.9V

Q 908

FM	SW
C 2.5V	3.35V
B 4.9V	4.9V
E 4.9V	4.9V

IC 101

FM	AM	FM	AM
1 0.15V	0.7V	9 0V	0.3V
2 0.15V	0.7V	10 0.7V	4.7V
3 0V	0V	11 1.7V	2.6V
4 3.6V	0V	12 0.3V	0.9V
5 3.6V	0V	13 0.7V	4.4V
6 4.9V	0V	14 0.7V	4.4V
7 3.7V	0V	15 0.7V	4.4V
8 0V	0V	16 0.3V	3.7V

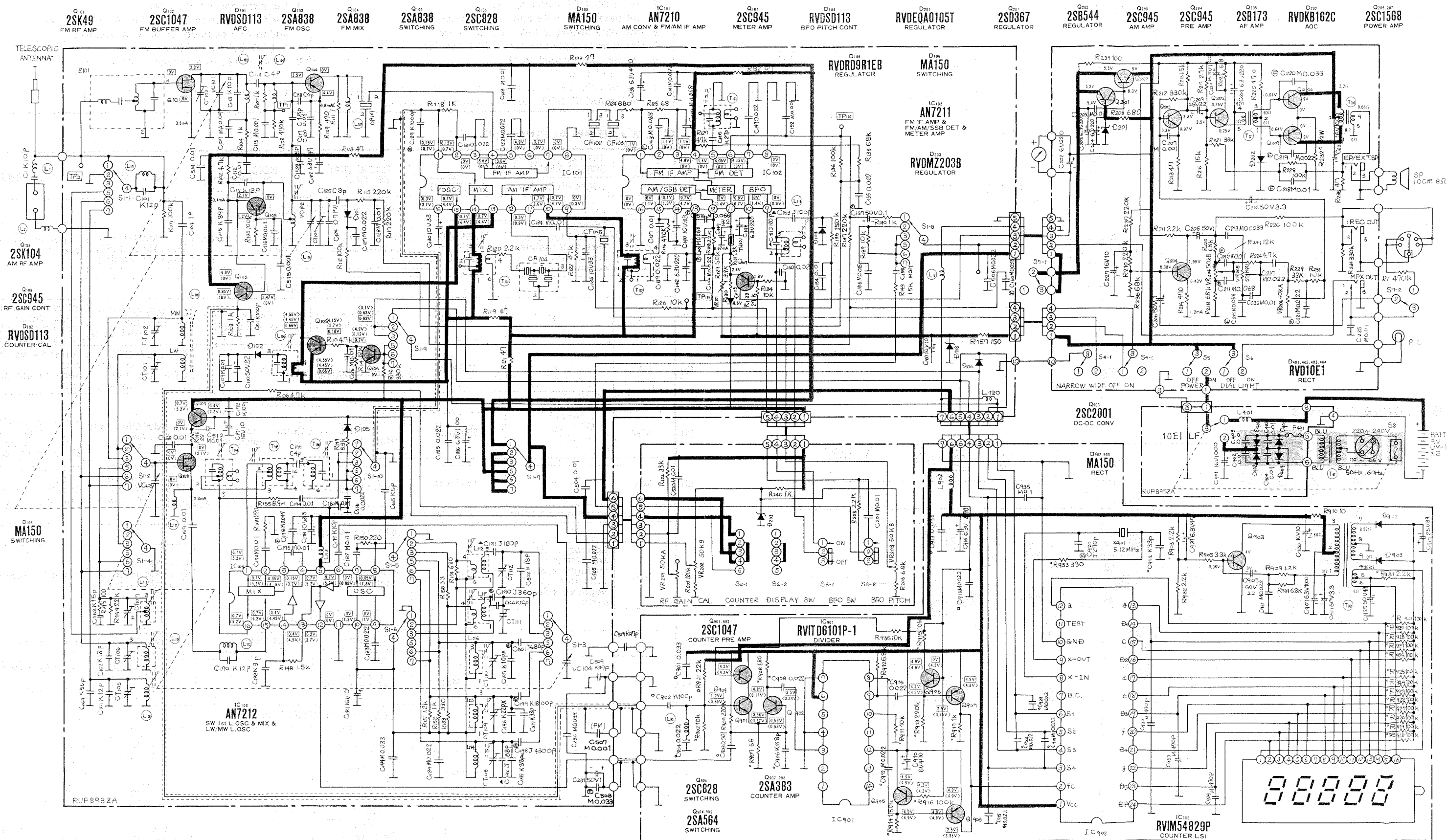
IC 102

FM	AM	FM	AM
1 1.1V	0V	9 0V	0.6V
2 1.1V	0V	10 0V	1.4V
3 1.1V	0V	11 0.9V	0.7V
4 4.9V	0V	12 0V	0.4V
5 1.4V	0V	13 0.7V	4.7V
6 4.05V	0V	14 0.1V	1.3V
7 4.15V	0V	15 0V	1.1V
8 0V	0V	16 0V	0V

IC 103

FM	AM	FM	AM
1 0.7V	5.2V	9 0V	1V
2 0.7V	5.2V	10 0V	1.3V
3 0.35V	4.6V	11 0V	0V
4 0.15V	3.7V	12 0.2V	3.7V
5 0.7V	5.2V	13 0.4V	4.5V
6 0.7V	5.2V	14 0.4V	4.45V
7 0V	0.95V	15 0.7V	5.2V
8 0.05V	1.3V	16 0.7V	5.2V

Schematic Diagram - Model RF-2800LBS



C	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	12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REPLACEMENT PARTS LIST..... Model RF-2800LBS (RD7803-1549)

NOTES: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. X - Z rank: X rank parts will cover 80% of repair needs.
X + Y rank parts will cover 95% of repair needs.
Z rank parts are less necessary.
3. Components identified by shaded area have special characteristic important for safety.
When replacing any of these components use only manufacturer's specified parts.
4. Part numbers shown in bold letters are service standard parts and may differ from production parts.
5. The O mark is used by the manufacturing plant only.

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
INTEGRATED CIRCUITS, TRANSISTORS AND DIODES				
IC101	AN7210	IC, FM/AM IF Amp.	1	O X
IC102	AN7211	IC, FM IF/Detector, AM, SSB Detector	1	O X
IC103	AN7212	IC, SW 1st L. Oscillator, Mix. LW/MW	1	O X
IC901	RVITD6101P-1	L. Oscillator	1	O X
IC902	RVIM54829P	IC, Divider	1	O X
Q101	2SK49	IC, Counter LSI	1	O X
Q102, 901, 902	2SC1047	Transistor (Si), FM RF Amp.	1	O X
Q103, 104, 105	2SA838	Transistor (Si), Buffer Amp., Counter Pre Amp.	3	X
907, 908	2SC828	Transistor (Ge), FM Oscillator, Mix, Switching, Counter Amp.	5	X
Q106, 906	2SC945	Transistor (Si), Switching	2	X
Q107, 109, 203	2SC945	Transistor (Si), Meter Amp., RF Gain Control, Pre Amp., AF Amp.	4	X
204	2SK104	Transistor (Si), Regulator	1	X
Q108	2SD367	Transistor (Si), Regulator	1	X
Q201	2SB544	Transistor (Ge), Regulator	1	X
Q202	2SB173	Transistor (Ge), AF Amp.	1	X
Q205	2SC1568	Transistor (Si), Oscillator, Power Amp.	1	X
Q206, 207	2SC2001	Transistor (Si), Switching	1	X
Q903	2SA564	Diode (Si), AFC, Counter Cap., BFO Pitch Control	2	X
Q905, 904	RVDS113	Diode (Si), Switching, Rectifier	3	X
D101, 102, 104	MA161	Diode (Si), Regulator	5	X
D103, 105, 106	RVDWZ094	Diode (Si), Regulator	1	X
902, 903	RVDEQA0105T	Diode (Si), Operation Compensator	1	O X
D108	RVDKB162C	Diode (Si), Regulator	1	X
D201	RVDWZ203B	Diode (Si), Regulator	1	X
D202	SM112	Diode (Si), Rectifier	4	X
D203				
D401, 402, 403				
404				
RECTIFIER				
Th101	RRT800	Thermistor, Temperature Compensator	1	X

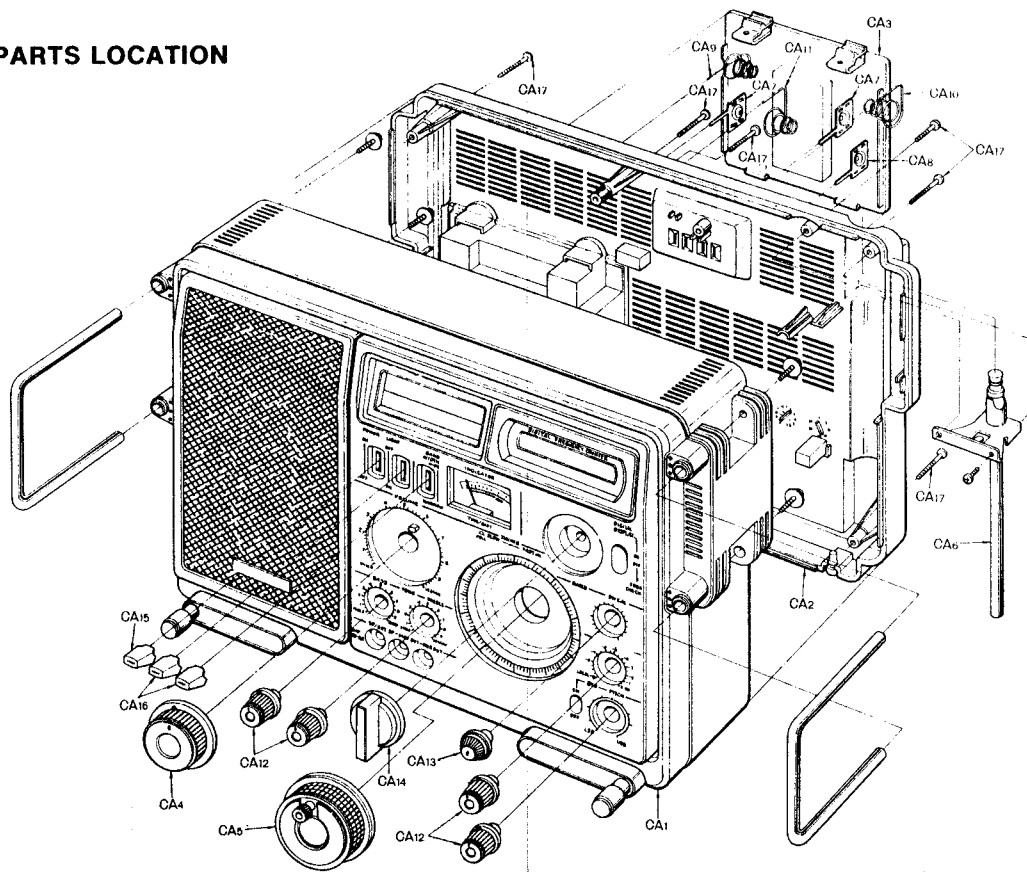


Fig. 29

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
CERAMIC FILTERS, COILS AND TRANSFORMERS				
CF101,102,103	RVFCF10S12FR	Ceramic Filter	3	X
CF104	RVFLFB6A	Ceramic Filter	1	OX
CF105	RVFBFB455C2	Ceramic Filter	1	OX
L102	RLF6F20	Antenna Coil,MW,LW	1	OX
L103	RLD4M9	Tuning Coil,FM	1	OX
L105	RLO4N105	Oscillator Coil,FM	1	OX
L106	RLO9M10	IFT,AM 1st IF	1	OX
L108	RLD7M3	Antenna Coil,SW3	1	OX
L109	RLA3M30	Antenna Coil,SW2	1	OX
L110	RLA3M40	Antenna Coil,SW1	1	OX
L114	RLD4M5	Oscillator Coil,SW3	1	OX
L115	RLO3M49	Oscillator Coil,SW2	1	OX
L116	RLO3M48	Oscillator Coil,SW1	1	OX
L117	RLO2M14	Oscillator Coil,MW	1	OX
L118	RLO1M8	Oscillator Coil,LW	1	OX
L119	RLO9M9	Oscillator Coil,BFO	1	OX
T101	RLI2M212	IFT,AM 2nd IF	1	X
T102	RLI2M205	IFT,AM 2nd IF	1	X
T103	RLI4M101	IFT,FM	1	X
T104	RLI2M204	IFT,AM 2nd IF	1	X
T105	RLI9M3	IFT,AM 1st IF	1	X
T106	RLI9M4	IFT,AM 1st IF	1	X
T201	RLT3F30	Input Transformer,P=700Ω:S=1KΩ	1	X
T202	RLT2H28	Output Transformer,P=45Ω:S=8Ω	1	X
T901	RLT9E2	Power Transformer,Time Display	1	OX
T401	RLT5K118	Power Transformer	1	OX
VARIABLE RESISTORS				
VR201,205,206	EVH0XAF15A54	Variable Resistor,50KΩ(A),RF Gain, Treble, Volume	3	X
VR202,203,204	EVH0XAF15B54	Variable Resistor,50KΩ(B),SW Cal, BFO Pitch,Bass	3	X
VR101	EVL4AA00B54	Preset,50KΩ(B),Meter	1	X
VARIABLE CAPACITORS				
CV101,102,103,104	PVC22K20T5L	Tuning Capacitor,W/Trimmer Capacitor(CT102,103,104,110)	1	Y
CT107,111	RCV1PX10AGS	Trimmer Capacitor	2	Y
CT101	RCV1PX15AGS	Trimmer Capacitor	1	Y
CT112	RCV1PX20AGS	Trimmer Capacitor	1	Y
CT105,106,108,109	RCV1PX30AGS	Trimmer Capacitor	4	Y
COMPONENT COMBINATION AND CRYSTAL				
Z101	RXABPMF1	Component Combination	1	Y
X901	RVCX5120N5Z	Crystal	1	OX

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
SPEAKER				
SP	EAS10P57SC	Speaker,Imp.32Ω,10cm(4"), PM Dynamic	1	OX
SWITCHES				
S1-1~S1-10	RSR6J01Z-H	Switch,Band	1	OX
S2-1,S2-2	RSS69Z-M	Switch,Digital Display	1	OX
S3-1,S3-2	RSS2B03Z-H	Switch,BFO	1	OX
S4-1,S5,S6	RSTX003Y-A	Switch,Band Width,Power,Light	1	OX
S7	RSS2B02Z-H	Switch,Phono/Radio	1	X
S8	RSR2A01Z-H	Switch,Voltage Selector	1	X
RESISTORS				
R113,119,121,123,132	ERD25TJ470	47Ω, ¼Watt, ±5%, Carbon	5	Z
R239,145	ERD25TJ101	100Ω, ¼Watt, ±5%, Carbon	2	Z
R118,147,150	ERD25TJ221	220Ω, ¼Watt, ±5%, Carbon	3	Z
R153	ERD25TJ331	330Ω, ¼Watt, ±5%, Carbon	1	Z
R109,225	ERD25TJ471	470Ω, ¼Watt, ±5%, Carbon	2	Z
R124,208,154	ERD25TJ681	680Ω, ¼Watt, ±5%, Carbon	2	Z
R107,103,104,111,140,240,514	ERD25TJ102	1KΩ, ¼Watt, ±5%, Carbon	9	Z
R131,148,215	ERD25TJ152	1.5KΩ, ¼Watt, ±5%, Carbon	3	Z
R120,128,205,211,932	ERD25TJ222	2.2KΩ, ¼Watt, ±5%, Carbon	5	Z
R149,905	ERD25TJ332	3.3KΩ, ¼Watt, ±5%, Carbon	2	Z
R102,106,110,127,224	ERD25TJ472	4.7KΩ, ¼Watt, ±5%, Carbon	5	Z
R114,126,134,139,231	ERD25TJ103	10KΩ, ¼Watt, ±5%, Carbon	5	Z
R143,221	ERD25TJ333	33KΩ, ¼Watt, ±5%, Carbon	2	Z
R122	ERD25TJ473	47KΩ, ¼Watt, ±5%, Carbon	1	Z
R101,105,112,136,226,228	ERD25TJ104	100KΩ, ¼Watt, ±5%, Carbon	6	Z
R115,117,137,210,237	ERD25TJ224	220KΩ, ¼Watt, ±5%, Carbon	5	Z
R116,212,234	ERD25TJ334	330KΩ, ¼Watt, ±5%, Carbon	3	Z
R1,108,156	ERD25TJ474	470KΩ, ¼Watt, ±5%, Carbon	3	Z
R133	ERD25TJ273	27KΩ, ¼Watt, ±5%, Carbon	1	Z
R146	ERD25TJ220	22KΩ, ¼Watt, ±5%, Carbon	1	Z
R151,909	ERD25TJ122	1.2KΩ, ¼Watt, ±5%, Carbon	2	Z
R130,155	ERD25TJ392	3.9KΩ, ¼Watt, ±5%, Carbon	2	Z
R138,236	ERD25TJ683	68KΩ, ¼Watt, ±5%, Carbon	2	Z
R206,218,220,934	ERD25TJ682	6.8KΩ, ¼Watt, ±5%, Carbon	4	Z
R216,143	ERD25TJ153	15KΩ, ¼Watt, ±5%, Carbon	2	Z
R213,235	ERD25TJ470	47Ω, ¼Watt, ±5%, Carbon	2	Z
R202,229	ERD25TJ333	33KΩ, ¼Watt, ±5%, Carbon	2	Z
R135,234	ERD25TJ154	150KΩ, ¼Watt, ±5%, Carbon	2	Z

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R203	ERD25TJ124	120K Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	1	Z
R910	ERD25TJ100	10 Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	1	Z
R214	ERD25TJ471	470 Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	1	Z
R125,222	ERD25TJ680	68 Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	2	Z
R217	ERD25TJ272	2.7K Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	1	Z
R232	ERX1ANJ1R0	1 Ω , 1Watt, $\pm 5\%$, Metal	1	Z
R907	RRD18XK680	68 Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	1	Z
R933	RRD18XK331	330 Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	1	Z
R908	RRD18XK681	680 Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	1	Z
R917	RRD18XK102	1K Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	1	Z
R903,931	RRD18XK222	2.2K Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	2	Z
R912	RRD18XK682	6.8K Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	1	Z
R902,911,915	RRD18XK103	10K Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	3	Z
R901	RRD18XK223	22K Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	1	Z
R916,918,919 920,921,922 925,926,927 928,929,930 923,924	RRD18XK104	100K Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	14	Z
R914	RRD18XK154	150K Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	1	Z
R904,913	RRD18XK224	220K Ω , $\frac{1}{8}$ Watt, $\pm 10\%$, Chip	2	Z
R158	ERD25TJ330	33 Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	1	Z
R157	ERD25TJ151	150 Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	1	Z
R144	ERD25TJ223	22K Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	1	Z
R241	ERD25TJ123	12K Ω , $\frac{1}{4}$ Watt, $\pm 5\%$, Carbon	1	Z

CAPACITORS

C104	ECCD1H010C	1PF, 50WV, ± 0.25 PF, Ceramic	1	Z
C177,118	ECCD1H040C	4PF, 50WV, ± 0.25 PF, Ceramic	2	Z
C1,113,166, 179	ECCD1H100KC	10PF, 50WV, $\pm 10\%$, Ceramic	4	Z
C101,111,161 170	ECCD1H120KC	12PF, 50WV, $\pm 10\%$, Ceramic	4	Z
C163	ECCD1H150KC	15PF, 50WV, $\pm 10\%$, Ceramic	1	Z
C162	ECCD1H180KC	18PF, 50WV, $\pm 10\%$, Ceramic	1	Z
C146,502	ECCD1H270KC	27PF, 50WV, $\pm 10\%$, Ceramic	2	Z
C161,172,511	ECCD1H101K	100PF, 50WV, $\pm 10\%$, Ceramic	3	Z
C117	ECCD1H1R5C	1.5PF, 50WV, ± 0.25 PF, Ceramic	1	Z
C517	ECCD1H330KC	33PF, 50WV, $\pm 10\%$, Ceramic	1	Z
C108	ECCD1H390KC	39PF, 50WV, $\pm 10\%$, Ceramic	1	Z
C195	ECCD1H330KU	33PF, 50WV, $\pm 10\%$, Ceramic	1	Z
C196	ECCD1H220KX	22PF, 50WV, $\pm 10\%$, Ceramic	1	○Z
C197	ECCD1H100KX	10PF, 50WV, $\pm 10\%$, Ceramic	1	○Z
C124	ECCD1H070DW	7PF, 50WV, ± 0.5 PF, Ceramic	1	Z
C107,115,116 152,207,326 507	ECKD1H102MD	0.001 μ F, 50WV, $\pm 20\%$, Ceramic	8	Z
C109,112,120 128,134,137 154,168,169 174,402,403 404,405,504	ECKD1H103PF	0.01PF, 50WV, $\pm 10\%$, Ceramic	13	Z
C126,133,173 158,175,180 182,201,205 225,520,521	ECKD1H103MD	0.01 μ F, 50WV, $\pm 20\%$, Ceramic	12	Z

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C139,149,150 185	ECKD1H223PF	0.022 μ F, 50WV, $\pm 10\%$, Ceramic	4	Z
C515	ECKD1H102PF	0.002 μ F, 50WV, $\pm 10\%$, Ceramic	1	Z
C516	ECKD1H222MD	0.0022 μ F, 50WV, $\pm 20\%$, Ceramic	1	Z
C156	ECKD1H153MD	0.015 μ F, 50WV, $\pm 20\%$, Ceramic	1	Z
C127,132,141 144,183,184 505,506	ECKD1H223MD	0.022 μ F, 50WV, $\pm 20\%$, Ceramic	8	Z
C213	ECKD1H332MD	0.0033 μ F, 50WV, $\pm 20\%$, Ceramic	1	Z
C160,220 508	ECFVD333MD	0.033 μ F, 25WV, $\pm 20\%$, Semi-Conductor	3	Z
C176	ECFVD473MD	0.047 μ F, 25WV, $\pm 20\%$, Semi-Conductor	1	Z
C138,143,211 215	ECFVD683MD	0.068 μ F, 25WV, $\pm 20\%$, Semi-Conductor	4	Z
C212,218,232	ECFVD103MD	0.01 μ F, 25WV, $\pm 20\%$, Semi-Conductor	3	Z
C217,219,221 931	ECFVD223MD	0.022 μ F, 25WV, $\pm 20\%$, Semi-Conductor	4	Z
C153	ECMS05101JH	100PF, 50WV, $\pm 5\%$, Mica	1	Z
C151,191	ECMS05121JH	120PF, 50WV, $\pm 5\%$, Mica	2	Z
C192	ECMS05680JH	68PF, 50WV, $\pm 5\%$, Mica	1	Z
C190	ECQS05361JZ	360PF, 50WV, $\pm 5\%$, Styrol	1	Z
C129	ECQS05102KZ	1000PF, 50WV, $\pm 10\%$, Styrol	1	Z
C199	ECQS05182KZ	1800PF, 50WV, $\pm 10\%$, Styrol	1	Z
C198	ECQS05432JZ	4300PF, 50WV, $\pm 5\%$, Styrol	1	Z
C145,510	ECQG05683MZ	0.068 μ F, 50WV, $\pm 20\%$, Styrol	2	Z
C186,210	ECEA1AS101	100 μ F, 10WV, Electrolytic	2	Y
C122,927	ECEA1AS470	47 μ F, 10WV, Electrolytic	2	Y
C142,148,202 203,204,214	ECEA1AS221	220 μ F, 10WV, Electrolytic	6	Y
C136,910,916	ECEA0JS471	470 μ F, 6.3WV, Electrolytic	3	Y
C130,135,140 178	ECEA1CS330	33 μ F, 16WV, Electrolytic	4	Y
C147,167,171 181	ECEA1HS100	10 μ F, 50WV, Electrolytic	4	Y
C110,905,209	ECEA2AS2R2	2.2 μ F, 100WV, Electrolytic	3	Y
C216,911	ECEA2AS3R3	3.3 μ F, 100WV, Electrolytic	2	Y
C206,208,231	ECEA2AS010	1 μ F, 100WV, Electrolytic	3	Y
C223,401	ECEA1HS102	1000 μ F, 50WV, Electrolytic	2	Y
C227,930	ECEA1CS100	10 μ F, 16WV, Electrolytic	2	Y
C907	ECEA0JS102	1000 μ F, 6.3WV, Electrolytic	1	Y
C925	ECEA1JS4R7	4.7 μ F, 6.3WV, Electrolytic	1	Y
C917	ECEA1VS330	33 μ F, 35WV, Electrolytic	1	Y
C920	ECQS05271JZ	270PF, 50WV, $\pm 5\%$, Styrol	1	Z
C922	ECUX1H330KC	33PF, 50WV, $\pm 10\%$, Chip	1	Z
C906	ECUX1H680KC	68PF, 50WV, $\pm 10\%$, Chip	1	Z
C902	ECUX1H101KD	100PF, 50WV, $\pm 10\%$, Chip	1	Z
C903	ECUX1H102ZF	0.001 μ F, 50WV, $\pm 20\%$, Chip	1	Z
C903,908,914	ECUX1H223ZF	0.022 μ F, 50WV, $\pm 20\%$, Chip	8	Z
C912,915,918 921,923,924	ECUX1H223MD	0.022 μ F, 50WV, $\pm 20\%$, Chip	6	Z
C901,913	ECUX1H333ZF	0.033 μ F, 50WV, $\pm 20\%$, Chip	2	Z
C165,522	ECCD1H050CC	5PF, 50WV, ± 0.25 PF, Ceramic	2	Z
C509,519	ECCD1H470KC	47PF, 50WV, $\pm 10\%$, Ceramic	2	Z
C164	ECCD1H680K	68PF, 50WV, $\pm 10\%$, Ceramic	1	Z
C501	ECQS05681JZ	680PF, 50WV, $\pm 5\%$, Styrol	1	Z
C932,934,933	ECKD1H471KB	470PF, 50WV, $\pm 10\%$, Ceramic	3	Z
C935	ECFVD104MD	0.1 μ F, 25WV, $\pm 20\%$, Semi-Conductor	1	Z

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C157	ECEA50VR1	0.1μF, 50WV, Electrolytic	1	Z
C188	ECKD1H030C	3PF, 50WV, ±0.25PF, Ceramic	1	Z
CABINET				
CA1	RYMF2800LBSX	Cabinet Assembly	1	OX
CA2	RYFF2800LBSX	Cabinet Cover Assembly	1	OX
CA2	RYFF2800LBSI	Cabinet Cover Assembly, For Italy	1	OX
CA3	RYNF2800M	Battery Cover Assembly	1	OX
CA4	RYT1F2800N	Knob Assembly, Volume	1	OX
CA5	RYT2F2800N	Knob Assembly, Tuning	1	OX
CA6	XEART160GE-Y	Telescopic Antenna, 7 Steps, 960mm	1	OX
	RJF1065Z	Terminal	2	OX
CA7	RJC205B	Terminal, Battery ⊕ Side	2	Y
CA8	RJC111A	Terminal, Battery ⊕ Side	1	Y
CA9	RJC505Z	Terminal Spring, Battery ⊖ Side	1	Y
CA10	RJC508Z	Terminal Spring, Battery ⊖ Side	1	OY
CA11	RJC509Z	Terminal Spring, Battery ⊖ Side	1	OY
CA12	RBN381Z	Knob, Bass, Treble, Pitch and etc.	4	OY
CA13	RBN420Z	Knob, SW Cal.	1	OY
CA14	RBS112Z	Knob, Band	1	OY
CA15	RBE13Y	Knob, Power	1	OY
CA16	RBE13X	Knob, Light, FM AFC	2	OY
	RHG316A	Foot, Cabinet	2	Z
	RHG886Y	Rubber, Speaker	1	OZ
CA17	XTN3+25C	Screw, Cabinet Cover M'tg	6	Z
CHASSIS				
CH1	RSG8ZS	Dial Mechanism Assembly	1	OX
CH2	RYDF2800LBSX	Dial Scale Assembly	1	OX
CH3	RXEF2800M	Dial Scale Chassis Assembly	1	OX
CH4	XBA2C08TRO	Fuse, 250V, 800mA	1	X
	RAD5-BT-11	Frequency Display	1	OX
CH5	XAMR43S100A	Pilot Lamp, 9V, 60mA	1	X
CH6	RSM2616Z-K	Meter, Tune/Battery	1	OX
CH7	RJJ115Z-H	Jack, AC IN	1	Y
CH8	RJF7A	Holder, Fuse	2	Z
	RJS31-1	Socket, Din	1	Y
	RUS323Z	Spring, Dial Gear	1	OZ
	RUS295Z	Spring, Dial Drum	1	OZ
CH9	RUV426Z	Cover, Voltage Selector	1	Z
CH10	RUV482Z	Cover, AC IN Jack	1	OZ
CH11	RDG5656Z	Gear, Dial	1	OZ
CH12	RDG5658Z	Gear, Dial Scale	1	OZ
CH13	RJS219Y-X	Socket (7P), PC Board	1	Z
CH14	RJS112Y-X	Socket (6P), PC Board	1	Z
CH15	RJS217Y-X	Socket (5P), PC Board	2	Z
CH16	RJS216Y-X	Socket (4P), PC Board	1	Z
CH17	RJS253Y-X	Socket (3P), PC Board	1	Z
	RJP119Z	Plug (7P), Socket	1	Z
	RJP142Z	Plug (6P), Socket	1	Z
	RJP116Z	Plug (5P), Socket	2	Z
	RJP109Z	Plug (4P), Socket	1	Z
	RJP137Z	Plug (3P), Socket	1	Z
CH18	RDV2Z	Belt, Dial	1	OY
	XYNR26+C6	Screw, Dial Gear M'tg	2	Z
	XXAR3H6S	Screw, Dial Scale M'tg	2	OZ

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
CH19	XUC2FY	Circrip, Shaft for Band Switch	1	Z
	XUC6FY	Circrip, Dial Scale Gear M'tg	1	Z
	XNS8	Nut, Bass, Treble and etc. M'tg	6	Z
	XWS8AW	Washer, Bass, Treble and etc. Mtg	6	Z
	RJJ62B	Jack, EXT.SP., MPX OUT, REC OUT	3	Y
ACCESSORIES				
	XEH1A1-P	Magnetic Earphone	1	Y
	RJA20Z-K	Power Cord, AC	1	Y
	RKE234Z	Hood, Dial	1	OY
	RQC9013Z	Belt, Cabinet	1	OY
PACKING MATERIALS				
	RPP214Z	Polyethylene Cover	1	Z
	RPN9227Z	Pad Complete	1	OZ
	(Not Available, Order	Pad, Left Side	(1)	
	RPN9227Z	Pad, Right Side	(1)	
	RPN2567Z	Pad, Both Side	2	OZ
	RPK590Z	Gift Box	1	OZ
	RPK590Y	Gift Box, For Italy	1	OZ
	RQX6198Z	Instruction Book	1	OY

CHASSIS PARTS LOCATIONS

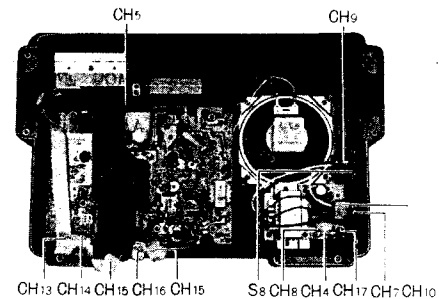


Fig. 30

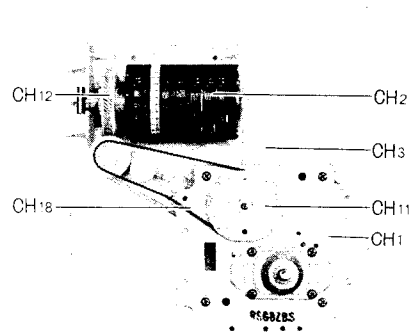


Fig. 31

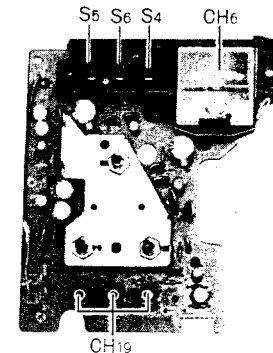


Fig. 32